

TROPICAL SEASHORE SURVIVAL

(Illustrated Lecture)

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This illustrated lecture on Tropical Seashore Survival has been prepared because some of you are stationed at tropical bases and because all of you may at one time or another find yourself flying over the tropics.

Most of the pictures I'll show you were taken while actually surviving. The Navy dropped me off, together with a few other men, on various Pacific islands to gather survival information. Our job was to survive until picked up, using only the equipment an Airman would have.

I am not going to relate our actual experiences, but instead am going to use the pictures to illustrate information and technics that you as a potential survivor should know in order to live under emergency conditions along tropical continental and island shores. Much of this information on tropical seashores applies to other areas as well—for example, the rock oven, though a seashore cooking method, can well be used in Russia and it will be demonstrated and you will use it at Saylor Park.

If you should bail out, or ditch in warm oceans, or even over tropical jungles, one of your first aims will be to reach sea coasts and beaches. It is, in general, easier to survive along beaches than it is to live in other topographic areas of the world.

You can survive along tropical coasts with practically no equipment, but you should have a sheath or pocket knife, waterproof matches in a case, and a machete.

You will find that life is much more comfortable if in addition you have: Underwater goggles, a waterproof flashlight, work gloves, a small file, and a sling spear. All of these items were recommended for inclusion in Tropical Seashore Survival kits following the experience of airmen in World War II.

1. If by chance you become a seashore survivor, it is quite probable that you will come down in water. More than likely you will have to pass through surf in order to reach shore and safety. Surf can be dangerous whether traversed by a swimmer or by a man in a raft. It has made a tragic ending to otherwise successful sea voyages.

2. If you have a choice, avoid these windward reefs. Pick the time and place to battle surf where it will give you the least resistance.

3. Whether you are swimming or rafting, approach the surf slowly, look it over and select your route. Once you start to row through don't change your mind. It's a good way to get swamped. If surf is very high, wait offshore for low tide.

4. Whether you come in on a raft or are swimming, ride the breakers shoreward like this—just back of the wave crest. Don't get too far

forward or you'll drop over the face of the wave and have the full force of the breaking wave drive you to the bottom. Use the breast stroke as it enables you to hold your position by swimming either backward or forward. When the comber breaks and dumps you in the shallow water off the reef, you can also swing your feet under you to touch bottom. At this time you are in a vulnerable position to be engulfed and battered by the next wave, so hasten to wade or swim toward shore dragging your raft with you.

5. When large waves are about to break over you, turn, face the incoming wave and dive into it. If this occurs in shallow water, dive to the bottom and grasp a coral formation or a rock until the wave crest passes. Then let the declining force of the wave carry you shoreward beyond reach of the next one. In such a situation your goggles will enable you to navigate safely, to see and observe underwater current action and they will eliminate panic. They may well be the difference between life and death, so make them a part of your personal survival equipment

6. The blue channel running seaward through the reef here is a rip current. If swimming you should avoid these backward or outward moving currents and come ashore through the surf. On the other hand, if you are in a raft or a boat you should select just such a channel to come for a landing as your main consideration is not current but how to avoid capsizing in the combers. You can expect to find rips at the mouths of

streams where fresh water prevents the growth of coral, thus forming submarine canyons such as this one. From offshore they are indicated by valleys in the shoreline.

7. If you get caught in an outgoing rip current like this one, swim diagonally across it to calmer water, not against or with it. It seldom pays to fight any current. Most rips are, fortunately, only a few hundred yards wide. You can often recognize them by the fact that water in them is usually rougher and choppiier than surrounding water. Keep in mind that many lives have been lost in rip currents. I helped rescue a seaman who was carried out in this very rip. Fortunately he had strapped on a Jap life preserver that he picked up along the beach.

8. If landing conditions appear too hazardous, keep moving along offshore. Don't attempt a landing where cliffs drop down to meet the sea. Instead —

9. Wait for help if you figure friendly natives may sight you.

10. Once you are ashore and rested, you will want to travel. You will soon find that beach travel is cooler and easier than inland travel. For here you have little or no vegetation to fight and you have a wide range of vision.

11. The best time to travel is at low tide. In hostile country, walk at the water's edge and let the waves erase your footsteps.

12. During the day, "hole up" in caves, banyan tangles or second growth jungle. Whenever feasible travel at night.

13. Sturdy shoes are needed as protection against rock bruises and coral cuts. If you have lost your shoes in the surf, make a substitute out of coconut husks or --

14. Tie your feet up in coconut cloth. Or if you have your parachute, make shoes from it. However, if you come down over water or in high jungle trees you will probably lose your chute.

15. The coconut cloth is found here, at the base of the coconut fronds or leaves. It is tough, durable and useful in many ways to a survivor.

16. Your travels will probably take you into mangrove swamps or forests which line many tropical shores. When they are small you can wade or walk around them on their seaward side at low tide, or you can traverse them by following the high tide mark which divides the mangrove forest from the strand or interior jungle.

17. Don't try to "bush whack" your way through the mangroves.

18. Instead, when travelling either seaward or shoreward follow these tidal channels.

19. Swimming may be necessary in the mangroves and you must resort to it when muck or water makes walking impossible. Wet your shirt and inflate it with air by blowing into the front opening while you are submerged. Don't let muck bother you. You can swim through it. In such places, it is well to keep an eye open for crocodiles.

20. If inter-island travel within an atoll is necessary, row or sail with the prevailing winds and follow the atoll contour keeping to the lee side of the reef or bar. You can often wade from one island to another at low tide.

21. Even before you start to travel your first thought may be how to get a drink of water. Drinking water is the limiting factor in tropical seashore survival. Under average conditions you need about a quart of water a day. Without it food is of little importance and your days are numbered. Water is usually available, if you know where and how to look for it.

22. Dig for it in a depression like this, back of the beach. In World War II, airmen died of thirst with water only a foot beneath them. I recall the incident of a Navy pilot who crash-landed his fighter plane along a dry desert beach. He died of thirst before searchers located him. The rescue party dug a shallow beach well almost under his plane and located fresh water.

23. In such places you do not have to dig deep. Even in desert country, various types of vegetation such as sedge, rushes and salt grass indicate that water is not far beneath the surface and can be had by a little digging.

24. Beach well water may be discolored and even brackish but is safe and potable. As you dip out the water more seeps in.

25. Where coconut palms line the shore, the green coconut will be the safest and most reliable source of water, better even than the beach well. Coconuts, however, are not easy to get.

26. To get green nuts, select a low tree with a good nut crop and walk up the trunk, native style, using old leaf scars as toe holds. Pressure grip the side of the bole with your hands and don't lock your arms or hands around the trunk. Sever the nut by raising and then snapping it quickly downward.

27. With a sharp machete, slice the rounded end of the nut until a small opening can be cut from which to drink. You can drink unlimited quantities of coconut water and even water from ripe nuts should not be passed up for fear of their exaggerated laxative properties.

28. In arid regions along shores and in deserts, water can often be drained from the roots of trees and bushes. Shallow roots such as these, store water and can be easily pulled up.

29. Cut off a section of root and drain it like this. A 5 or 6 foot section of such a root will yield a pint of good drinking water. Think back on this method and try it out if you ever find yourself trekking across one of the large deserts of Asia.

30. Succulent leaves and stems such as you see here on the seaside purslane will relieve thirst until better sources of water are located. Just chew up the fleshy leaves and swallow them.

31. In arid regions, many plants such as these Bromeliads catch water in the rainy season and hold it through the dry season. Make use of these natural reservoirs.

32. Back of the shore, jungle vines can be cut and drained of their water. All yielding clear, more or less tasteless water can be considered safe. This shot was taken on the island of Palawan in the Philippines.

33. Food is second in importance to water and the coconut will be one of your best food sources. Nuts and sap are available the year 'round and can be prepared in many ways. This man is eating the soft white meat of a green or "spoon nut". It can be spooned out of a split nut using a sharp shoulder slashed off the outside husk. The chute is being used to provide shade, an important consideration along most beaches.

34. This harder meat of ripe nuts is less digestible and not as nourishing as the green nuts. Ripe nuts can be eaten fresh, grated and dried to copra or the milk can be squeezed out of them for food or drink.

Oil separates from the milk on standing and it makes an excellent sunburn preventative.

35. Don't pass up these old nuts sprouting beneath trees. They contain a spongy center that can be eaten raw, but is more tasty and more nourishing when cooked. Also the celery-like heart contained in the shoot is excellent. It is known as "millionaire's salad".

36. Sprouted nuts should be husked and then baked for two hours in a rock oven. When done, the yellow potato-like core tastes somewhat like a boiled yam and is very nourishing. A Marshallese friend of mine avoided the Japs during the entire time they occupied his islands and his main diet was these baked sprouted nuts.

37. Here is the makings of several meals--coconut heart from a small tree, sprouted coconuts and shellfish. The sprouted nuts should be husked like those in the center of the slide. To open a husked nut, strike the three longitudinal ribs with a knife handle or rock. The nut casing will split cleanly into equal halves.

38. A survivor must be able to open a coconut, native style, without a machete. Lacking the "know-how" it's not an easy task. Use a hard sharpened "husking stick" like this one firmly anchored in the ground. Hold the nut by both ends and thrust down on the pointed stick, taking care not to puncture the inside shell or nut. A backward twist of your wrists will pry off a section of the husk. Repeat this action until the nut within comes free of the husk.

39. This slide illustrates how coconut sap or jugaroo is collected. Coconut sap is food or drink in the form of a high sugar content beverage. To get it, tightly bind with twine all but the last few inches of a young flowering spike. Slice off the unbound tip and hang a container beneath it. Collect the sap once a day and cut a fresh cross-section from the spike to insure continued sap flow. This can be done at all seasons of the year.

40. Cover the cut with leaves to keep flies away.

41. In addition to the coconut, numerous other plant foods will provide you with food along tropical shores. At any one time or place they may tip the balance in your favor. Pandanus, in the center here, is distributed along many shores and some fruits are usually available and ripe when needed by a survivor. Always while traveling be constantly on the lookout for both animal and plant foods.

42. These fibrous succulent tips of the Pandanus keys contain sugar and starch which you can chew and suck out. Edible seeds are also found within the keys. Next to the coconut, the Pandanus is one of the most all-around useful plants.

43. Bread fruit trees with their large fruits are abundant along coasts and on inhabited islands. It is the staple food of many Pacific island peoples. It must be cooked. Just drop the fruit in a bed of coals or cook them in a rock oven.

44. You will usually find taro near habitations and in wet low areas. The starchy roots, the stem and the young leaves can all be eaten, but must be cooked.

45. Arrowroot or Tacca, the yellow plant here, has starchy tubers that are easy to dig up. They must, however, be crushed and washed before being cooked.

46. All palms should be considered as a possible source of food. Try the hearts, fruits, sap and stored food within the trunks. Look for the Nipa palm at the edge of brackish water.

47. The white kernel inside the individual nuts is edible. Young, yet fully developed nuts are the best. The meat of the old ones is very hard and rather indigestible.

48. There are thousands of these edible plants. By learning a few at a time you will soon be able to make use of them. The young leaves of many such as this Thespesia can be cooked as greens.

49. Others furnish nuts such as these Indian almonds which grow along the shore.

50. The nuts of Ochrosia are rich in fats and proteins.

51. Some edible plants will be similar to those you know at home-- a wild cucumber on Guam.

52. And a wild squash on the island of Palawan.

53. Some of the fruits such as this passion fruit are delicious and are found throughout the tropics.

54. For others such as the foul-smelling Morinda you must acquire a taste. This is surprisingly easy to do when you haven't eaten for a few days. This fruit smells and tastes like limburger cheese.

55. Along any shore you have both the land and water from which to draw sustenance. The reef ranks with the coconut as a source of emergency food. To make the most use of it you should be able to swim, preferably underwater as well as on top, and you must arrange your schedule of living around the daily tides.

56. Low tides are the time to hunt lobsters, to spear fish and to pick up shellfish on the reefs. Diving goggles are preferable to this face mask, but neither are absolutely necessary: a fish spear, gloves and a waterproof flashlight make reef foraging still more efficient. See that they are part of your emergency equipment. A hard pointed stick like this will do for a spear.

57. Shellfish are usually the easiest source of food for the inexperienced survivor to obtain. One type or another may be found attached to mangrove roots, buried in sand, fastened to the reef, or concealed under rocks.

- 58. Even these tiny bivalves, when gathered in large numbers, will furnish a stew meal.

59. Large clams such as Tridacna are found imbedded in living coral reefs. They have brilliantly colored mantles (this one is black) which are exposed when the shells are open. Thrust your knife blade to the bottom of the opened valves and cut the large adductor muscle which closes the shell. The edible contents can then be removed.

60. These giant clams or Hippopus are not imbedded in coral, but are found on rocky bottoms and in open sandy spots.

61. To open them, bash in the shell where the valves close and insert a knife to cut the adductor muscle. If you place them on a bed of coals they will cook and then open of their own accord.

62. The large valve muscle to the right of the shell and a fatty sack the size of a tennis ball, are excellent raw and much tenderer than when cooked.

63. Some crabs are active in the daytime and are relatively easy to catch. The colorful Grapsus scuttles over the rocks at the water's edge, but furnishes no more than just a bite to eat.

64. To remove hermit crabs from their shell homes, grasp their legs and claws and turn them with the spiral of the shell. A match or

hot brand held against the shell encourages them to loosen up. Their best use is for baiting lines, but they can be roasted in the shell and eaten.

65. The coconut crab lives on land, is active at night and cuts holes in coconuts to get at the meat. They can be spotted with a light and picked up. Hold them down with a stick and then grab their big pinching claws. They can crush your finger if you are careless.

66. Coconuts with holes the size of a silver dollar cut in them are signs of the crabs' presence. When you catch one tie him up in this manner until you are ready to broil him on a bed of coals.

67. The best crabbing is at night on the reef. In the light of a coconut frond torch or a flashlight, crabs may be seen and speared or pinned down in this way and grabbed by their big biting claws.

68. Spiny lobsters are usually abundant on reefs where there are caves and crevices in the coral. They are active at night and can be grabbed in shallow water when located by torchlight. You'll have more luck catching them if you use goggles. Swim over rocky bottoms as shown here, in water from 1 to 5 feet deep, and peer into all nooks and crevices under rocks. This picture was necessarily taken in the daytime, but remember that night lobstering is best.

69. When caught in the beam of a light, the lobster will remain motionless for a long enough period to be grabbed or speared. Their eyes will shine dully like a lighted cigarette.

70. Lobsters swim backwards so when grabbing them by hand, hold the light in front and reach for them from behind. The spines on the lobster can gash your hand, so wear gloves if you have them.

71. The small reef octopus haunt holes and crevices in the reef. Consider them not as a hazard but as a food. They can be speared and then finished off by turning the body sac inside out. If they grab your arm with their tentacles, run your hand down your arm to break the hold of the suction discs. Don't waste effort trying to pull off the tentacles. Octopus meat, though rubbery, has a delicate flavor similar to lobster.

72. Coral reefs teem with fish, and spear fishing is well worthwhile if you are equipped with goggles and can improvise a spear. It is also a fascinating sport. Spend your time looking under rocks and in coral crevices where fish can be easily located and cornered.

73. Many types of reef fish can be speared without the use of goggles. Look for flounders and small sting rays on sandy bottoms. When you impale a fish, do not move the spear until you move the fish up on the shaft where he cannot wriggle loose.

74. Small sharks can often be cornered in tidal pools and shallow water. They are very good eating.

75. There are numerous other excellent fishing methods. With the use of prepared fish poisons, or natural ones used by the natives, you can make a haul like this in tidal pools. Your gill net will likewise prove

very effective in tidal pools at low tide. Fish attracted to a light of ebb tide can be slashed in shallow water by hitting them with the back of a machete. This is known as "chop fishing" and you often get more fish than you can possibly eat.

76. I have told you that the reef will be one of your chief sources of food. You can very well go on the assumption that there is nothing that will harm you while you forage on the reef. However, at certain times and places you should keep your eyes open for the bubble of the Portuguese-man-of-war. These animals can inflict a very painful sting, which may result in drowning by causing cramps and panic.

77. Moral eels can bite, but will usually not do so unless you corner them. Some sea snakes are poisonous, but do not attack unless forcibly restrained.

78. These cones and Terebras are poisonous when they bite, but it is almost impossible to make them do so.

79. Needle-like sea urchins can inflict wounds if you reach carelessly under rocks. One species contains a poison that is more painful than serious.

80. Puffer fish are generally poisonous and should not be eaten. Trigger and file fish should be eaten only with caution. They have no overlapping scales and eyes set far back in the head which characteristics

readily distinguish them from other reef fish. If you develop cramps, nausea and vomiting following a meal of reef fish, drink excessive quantities of salt water and get rid of all the food you have eaten.

81. Some sea cucumbers are edible, others not. It is best to leave them alone, since they have little food value.

82. All this food that you will gather will be more nourishing and tasty if you cook it. The rock oven is a cooking method well suited to the seashore where digging is easy. Check out on these steps, as you will do this at Saylor Park. First dig a pit and build a fire in it.

83. Next, place a grate of wood over the fire and cover it with rocks. When the grate burns through, rake out the burning brands and coals and pave the bottom and sides of the pit with the hot rocks.

84. Place a layer of green leaves on the rocks and then put on your food—in this case sprouted coconuts, at Saylor Park a venison roast.

85. Cover the food with leaves.

86. Then pile sand on top and let the food cook. You can forage all day and return to a warm meal. Food is almost never burned and two hours will cook most foods—even a medium-sized roast.

87. Broiling is quicker in the cases of this coconut crab and for fish, but dries out your food. Fish are delicious when cooked ungutted and unscaled on a bed of coals.

88. Shelters and beds like this one on a small Marshallese island are more or less essential to any prolonged and comfortable existence. Their main function is to give protection from rain and sun and to insure rest.

89. If you have sufficient energy, make a bed the first night and construct a shelter later. You can make a comfortable bed by laying down two parallel rows of split coconut fronds. The leaflets should overlap in the center of the bed.

90. To divide a frond, break or cut at the tip and split down the center.

91. A final topping of the bed with a thatch sheet, adds greater comfort.

92. To plait or thatch a frond, start at the butt end of a coconut leaf and bend the 3rd leaflet back over the 2nd and under the first. Next, bend the 5th leaflet back over the 4th and under the first. Continue in this manner. It's not as difficult as it sounds.

93. If rain is not anticipated a cool insect-proof bed can be erected in this manner.

94. When you come to lashing together beds and shelters and need fishing lines, you will find how useful natural fibers can be. Fibers may be stripped from leaves such as this Agave. Try it with the Yucca you will see on the trek.

95. Other fibers can be stripped from the bark of trees and bushes. This is Hibiscus or Raw-common on the Pacific Islands.

96. Roots both aerial and underground furnish fibers. Here fibers are being stripped from Pandanus prop roots.

97. To make a line from fibers, hold two groups of fibers in each hand and twist clockwise with your fingers, then cross over counter-clockwise. Make ropes the same way.

98. - 99. This has been merely an introduction to tropical seashore survival. A few days of actual training will go far toward insuring your safety under emergency conditions. Try to practice the following survival procedures if you get the opportunity; Swimming and rafting in surf, mangrove travel, reef fishing and foraging, use of the coconut, use of plant foods, cooking in a rock oven, construction of shelters and digging of beach walls. Survival along tropical shores can almost be boiled down to knowing how to make full use of the coconut and how to secure food on the reef.